NOTE XXIII.

ZOOLOGICAL RESEARCHES IN LIBERIA.

LIST OF MOLLUSCA,

with descriptions of new species.

BY

M. M. SCHEPMAN.

(Plate 10).

The following paper contains a complete list of the Mollusks, collected during the travels of Messrs. Büttikofer and Sala (1879—1882), of Mr. Stampfli, sent out by Mr. Büttikofer after his return from Liberia (1884—1885), and of a second visit to that country by Büttikofer and Stampfli (1886—1887). As the principal intention of the mentioned travellers was to collect vertebrated animals, there was not much time left to bestow upon Mollusks, most of which were collected by Mr. Büttikofer in the country of Grand Cape Mount, where especially all the marine forms were obtained. Full explanations as to the visited localities are given in the introductions to the lists of Birds by Büttikofer (see: Notes Leyd. Mus. 1885, p. 129 & ff. with map; 1886, pp. 243—245, and 1888, p. 59—63 with map).

The learned Dr. H. Dohrn of Stettin, who obtained ample collections of Liberian Mollusks from his collector Mr. Schweitzer, who explored about the same localities, has kindly assisted me in the determination of some doubtful species, while Dr. A. Brot found three new species amongst the specimens of the genus *Melania*.

a. Land- and freshwater Mollusks.

1. *Vaginula pleuroprocta* v. Marts. — A few specimens from Schieffelinsville.

2. *Streptaxis Monroviana* Rang. — One specimen, without exact locality and probably collected by Mr. Büttikofer, belongs to the form figured in Pfeiffer's Novitates Conchologicae, Pl. 142, fig. 5; a few others, collected by Mr. Stampfli, belong to the same variety and to the var. *rimata* Pfr. Several young specimens and an adult one of the var. *Recluziana* Petit, are found by Büttikofer at Schieffelinsville.

I have availed myself of this opportunity, to examine the radula of a young specimen of this species. The juvenile state was ranged. by Rang in the genus *Helix* (Ann. des Sciences nat. 1831) till Pfeiffer in his Monographia Heliceorum, III, p. 81, and Prof. von Martens (Malak. Blätter, 1866, p. 104) supposed it to be the young of *Streptaxis nobilis* Gray = *Monroviana* Rang. Dr. Dohrn, after a comparison of a great number of specimens, came to the same conclusion (Malak. Blätter, 1866, p. 136), the correctness of which has been fully confirmed by the examination of the radula.

The length of the radula of a snail removed from a shell which measures 12 mm. in its greatest diameter, is about 14 mm., the breadth is scarcely 2 mm. The numerous teeth converge towards the median line at a rather acute angle. The number of transverse rows of teeth or spines goes from 65 to 70, the longitudinal rows amount to about 57 on each side, and consequently a transverse row is composed of about 115 rows. It is however difficult to ascertain the precise number of teeth, especially in consequence of the many small particles of food which adhere to the teeth and which can only partially be removed by repeated washings. The teeth are simple and ensiform; the central ones are the longest and they decrease in length towards the margin of the radula. The disposition and form of the teeth indicate decidedly that this species ought to be ranged among the Streptaxidae.

3. *Limicolaria turbinata* Lea; Reeve, Conch. Iconica, *Bulimus*, fig. 605. — From Grand Cape Mount. At the same locality many specimens of *L. tenebrica* Rve and *spectralis* Rve are found, which, according to Dr. Dohrn, should be considered merely as varieties of *turbinata* Lea, the oldest name of the species. A few specimens from the Junk River are collected by Stampfli.

4. *Perideris torrida* Gould. — One specimen from Millsburg on the St. Paul's River; a few others without exact locality and from the Junk River, those from the Junk River collected by Stampfli.

5. *Perideris interstincta* Gould. — From Hill-town. It is the variety figured by Pfeiffer in his Novitates Conchologicae, Pl. 137, fig. 3.

6. *Achatina variegata* Col. — Several specimens from Soforé place and the St. Paul's River.

7. *Achatina purpurea* Chemn. — Many very fine specimens and a few still very immature ones from Schieffelinsville.

8. *Achatina Knorri* Jonas = *prunum* Rve.

9. *Stenogyra involuta* Gould. — Many specimens of the ordinary dimensions, figured by Pfeiffer, Philippi and Reeve, from Schieffelinsville. A specimen from Hill-town, decollated or broken, is much larger, and belongs, according to Dr. Dohrn, to a var. major = *bacilliformis* Jonas.

10. *Stenogyra striata*, Lea. — Many specimens from Schieffelinsville, living in the trunks of hollow palmtrees.

11. *Ennea Liberiana* Lea. — From Schieffelinsville.

12. *Paludina Liberiana*, n. sp. — Shell ovately turbinated, imperforate, of a dark olive colour; the spire is eroded, the number of persisting whorls is 3, they are but little convex; the whole shell is covered with very small granules, which are arranged spirally, moreover the whorls show several lines of growth, some of which are darker coloured. The suture is not very deep for the genus, last

whorl rounded, with only a slight indication of an angle. Aperture nearly semicircular, a little effused beneath. Columella nearly straight, forming an obtuse angle with the under margin. Interior of the aperture bluish white, with a black margin all around.

Alt. 24, lat. 19; alt. of aperture 15, lat. 10 mill.

Found on rocks in the St. Paul's River near Bavia.

Of this shell there is only one good specimen, the others are more or less bleached or broken. They give however a good idea of the species, which is remarkable by the angle of the under part of the aperture.

13. *Melania nigritina* Mor. — A few specimens of a rather small form, with the spiral striae not much developed, but sufficiently visible, after having been well cleaned, to distinguish it from the allied *Guineensis* Reeve. — Found near Hill-town.

14. *Melania Sancti-Pauli*, n. sp. — Shell cylindrically turreted, with numerous lines of growth decussated by spiral ridges which vary much in number (from 1—6 on the penultimate whorl), nearly wanting in some specimens; the upper whorls obscurely carinated, and the shell often a little granulated; colour dark olive green, with a brownish tint and in some specimens with a dark band. Spire much decollated, persisting whorls about 4, much inflated, but little increasing in height and breadth, suture deep, last whorl still more inflated, rounded. Aperture small, ovately oblong, angular above, effused beneath. Columella arched; interior of the aperture bluish white, outer margin, in the adult, with a black rim. Operculum paucispiral.

Alt. 22, lat. 9$^1/_2$; alt. of aperture 7, lat. 5 mill.

Found on rocks in the St. Paul's River near Bavia.

This species differs from the following and from *M. nigritina* Mor. chiefly by the inflated whorls and the cylindrical shape, from *M. decollata* by the effused aperture.

15. *Melania Liberiensis*, n. sp. — Shell oblong, conical, sculpture and colour very similar to that of the preceding

species, but little decollated, whorls rather flat, sloping, sometimes a little scalariform; suture, except in the last case, not deep; the whorls are more or less carinated, their number amounts to 7, last whorl a little inflated, obscurely carinated. Aperture elongate ovate, angular above, effused beneath. Interior of the aperture bluish white, outer margin, in the adult, with a black rim. Columella arched. Operculum paucispiral.

Alt. 25, lat. $9^1/_2$; alt. of apert. 8, lat. 5 mill.

On rocks in the St. Paul's River near Bavia.

Allied to the preceding species, but recognisable by the conical shape and flatter whorls. It may be distinguished from *decollata* and *nigritina* by the shape of the aperture.

16. *Melania Büttikoferi*, n. sp. — Shell small, rather shortly conical, decollated, colour yellowish olive, with a broad blackish band at the periphery and another round the base, (one specimen, larger than the others but rather defect, is blackish), sculpture: numerous thread-like lines of growth and spiral cords, of which there are about 10 on the last whorl and 4 on the penultimate one, these cords are all or partially darker than the rest; whorls about 3 in number, rather inflated, with a well marked suture. Aperture ovately oblong, angular above, more or less effused beneath. Columella tortile. Interior of the aperture bluish white.

Alt. 13, lat. 8; alt. of aperture 7, lat. $4^3/_4$ mill.; of the large specimen 12 : $9^1/_2$; 8 : $5^1/_2$.

On rocks in the St. Paul's River near Bavia.

Easily distinguished from the two preceding species, by the short, conical shape and the regular spiral cords.

It is on the authority of Dr. Brot, that I have ventured to describe these three forms as new.

17. *Claviger auritus* Müll. — One specimen without exact locality, and another collected by Stampfli on the Junk River.

18. *Claviger Matoni* Gray, var. *loricata* Reeve. — Several specimens from Grand Cape Mount.

19. *Claviger Byronensis* Gray. — Fine specimens from the St. Paul's River near Clay Ashland.

20. *Ampullaria balanoidea* Gould. — Many specimens from Grand Cape Mount and a few from the rocks in the St. Paul's River near Bavia, one of which has the spire not eroded.

21. *Ampullaria vitrea* Born. — A good number of this species, which formerly was very rare and the generic relation of which was still misunderstood by Pfeiffer, has been collected at Grand Cape Mount.

22. *Neritina rubricata* Mor. — A few specimens from the Junk River, collected by Stampfli.

23. *Neritina Adansoniana* Recl. — A single specimen collected at Grand Cape Mount.

24. *Neritina Oweniana* Gray. — One specimen without exact locality, with the columellar plain blackish. There are a few other specimens, from the St. John's River, agreeing in most respects with the description of *N. Hessei* Böttg.; Dr. Dohrn thinks, that these are merely very old specimens from rapid streaming water.

25. *Cyrenoides Dupontiae* Joannis. — To this species Dr. Dohrn brings a single valve of a shell found in the St. John's River.

26. *Aetheria plumbea* Fer. — One small specimen, which is moreover in a bad state of preservation, from rocks in the St. Paul's River near Bavia.

27. *Dreissena africana* Van Beneden. — Many specimens from the Fishermanlake near Bendo. All the specimens are more or less eroded, and the two rows of minute scales, described and figured by Van Beneden, are wanting.

b. Marine Mollusks.

1. *Pyrula morio* Linn. — A specimen from Grand Cape Mount has the tubercles obsolete; two tuberculate specimens and an intermediate one are collected by Stampfli on the Junk River.

2. *Purpura haemastoma* Linn. — Many specimens from Grand Cape Mount.

3. *Purpura neritoides* Linn. — Many specimens from Grand Cape Mount.

4. *Triton tranquebaricus* Lam. — One specimen from the Junk River, collected by Stampfli.

5. *Cypraea stercoraria* Linn. — A few specimens from the same origin as the preceding species.

6. *Littorina punctata* Gmel. — Together with the next species.

7. *Littorina striata* King, var. *granosa* Phil. — From Grand Cape Mount; varying in the form of the spire, which is more or less elevated, as well as in the disposition and number of the granules.

8. *Tympanotonus fuscatus* Linn. — Two specimens without exact locality.

9. *Siphonaria grisea* Gmel. = *venosa* Rve. — Many specimens from Grand Cape Mount.

10. *Gadinia afra* Gray. — Many specimens from Grand Cape Mount.

11. *Nerita atrata* Chemn. — Many specimens from Grand Cape Mount.

12. *Fissurella* sp. aff. *obtusae* Sow. — A few specimens from the same locality as N⁰ 9—11.

13. *Cytherea (Tivela) tripla* Linn. — One small specimen without exact locality.

14. *Mytilus senegalensis* Lam., var. *semistriata* Krauss. — A few specimens from Grand Cape Mount.

15. *Mytilus perna* Lam. — Rather numerous; from Grand Cape Mount.

16. *Mytilus* sp. — One specimen, radiately grooved, resembling *M. senegalensis* Lam. = *variabilis* Krauss (Süd-Afr. Mollusken, Pl. IV, fig. 5) but differing in some respects; from Grand Cape Mount.

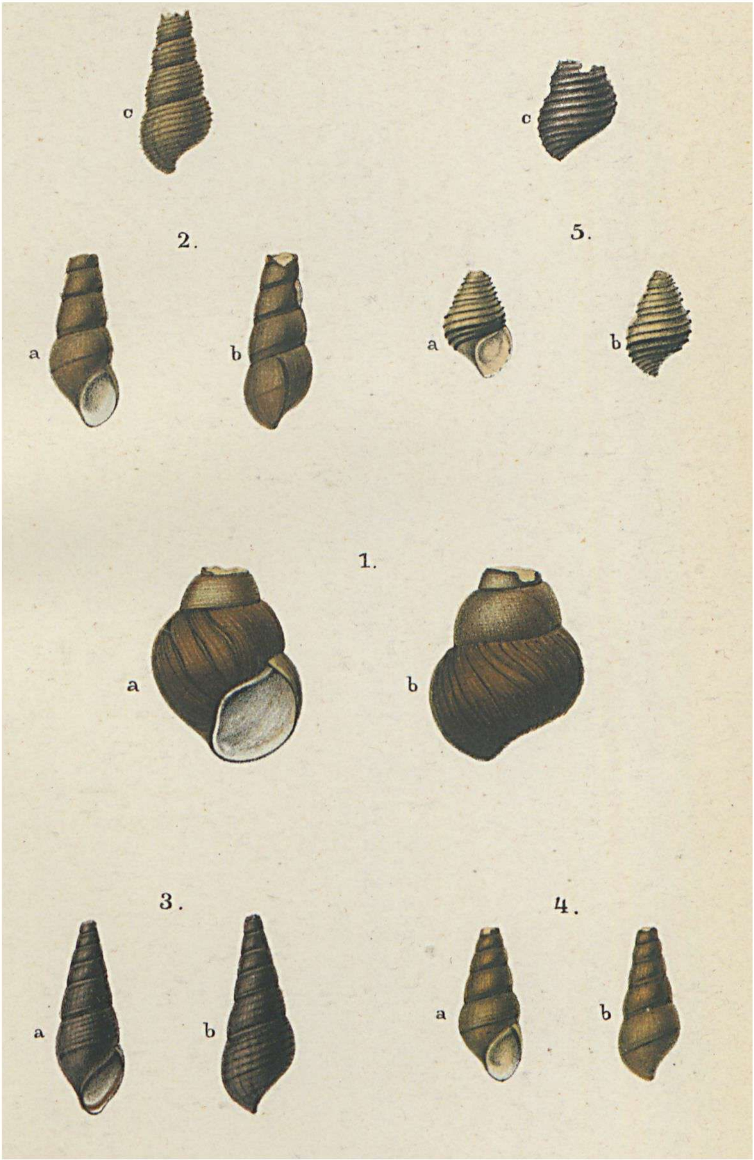
17. *Ostrea* sp. — Two specimens, too much eroded to be discriminated with certainty, from the same locality as the preceding species.

EXPLANATION

OF

Plate 10.

Fig. 1. *Paludina Liberiana* Schepm.
  a. ventral view.
  b. dorsal view.
» 2. *Melania Sancti-Pauli* Schepm.
  a. ventral view.
  b. dorsal view.
  c. another specimen to show the variability.
» 3. *Melania Liberiensis* Schepm.
  a. ventral view.
  b. dorsal view.
» 4. *Melania Liberiensis* Schepm.
(another specimen to show the variability).
  a. ventral view.
  b. dorsal view.
» 5. *Melania Büttikoferi* Schepm.
  a. ventral view.
  b. dorsal view.
  c. a larger specimen (defect).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A. J. J. Wendel ad nat. del. et lith.
P.W.M. Trap impr.

Liberian Molluscs.